Ground Water
of Vermont
A Division of Marin Environmental, Inc.

JAN 13 10 31 AM '97

8 January, 1997

Mr. Charles Schwer
State of Vermont DEC
Waste Management Division
103 South Main Street, West Building
Waterbury, Vermont 05671-0404

RE: Troy Country Store, Expressway Investigation Report (Site # 96-~~1983~~ 2059)

Dear Mr. Schwer,

Enclosed is one bound copy of the Initial Site Investigation Report for Troy Country Store located in Troy, Vermont.

Please call me if you have any questions or comments regarding this report.

Sincerely,

K. Fredrick
FOR

Robert J. Ross, CGWP
Hydrogeologist

cc: Gayton Veilleux

enclosure

Ref: 96069C02.DOC

One Mill Street, Box C-5 • Burlington, VT 05401 • (802) 860-6065 • Fax (802) 860-6076

Jan 13 10 32 AM '97

INITIAL SITE INVESTIGATION REPORT

TROY COUNTRY STORE
Route 100
Troy, Vermont

96-2059

2 January, 1997

Prepared for:

Troy Country Store
P.O. Box 187
Troy, Vermont 05868

Contact: Gayton or Linda Veilleux
Phone: 802-744-6146

Prepared by:

Ground Water of Vermont
1 Mill Street, Box C-5
Burlington, VT 05401

Contact: Robert J. Ross, CGWP
Phone: 802-860-6065

GWV Project #: V96-069
GWV Document #: 96069R02.DOC

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EXECUTIVE SUMMARY

Ground Water of Vermont (GWV) has conducted an initial site investigation at Troy Country Store located on Vermont Route 100 in Troy, Vermont and has concluded the following:

- Petroleum releases from former underground storage tank (UST) systems at the site appear to have resulted in a minor impact to ground water in the vicinity of the former UST systems. Analytical results of ground-water samples collected from four on-site monitoring wells did not detect the presence of petroleum compounds above the VGESs.
- Observations made during the UST closure and ground-water sample results from monitoring wells completed in and downgradient of the former UST locations suggest that residual soil contamination is limited to the immediate vicinity of the former USTs.
- The residual subsurface contamination at the site does not appear to pose a threat to any near by sensitive receptors.
- PID readings obtained in the basements of both on-site buildings did not identify VOCs above background during screening on 27 August 1996.
- No drinking-water supplies appear to be at risk from the residual soil contamination at the site.
- Surficial materials at the site consist predominately of brown medium-to-fine silty sand, with occasional thin lenses of silt and clay. On 2 October 1996, the water table was found to be about 9 to 14 feet below ground surface, and exhibited a southwesterly trending gradient of about 4 percent. The representative range of ground-water flow velocities are expected to be between 0.06 and 5.6 feet per day.

On the basis of the results of this investigation, GWV makes the following recommendations:

1. The four on-site monitoring wells should be resampled to confirm the October 1996 analytical results. The samples should be analyzed for BTEX compounds and MTBE by EPA Method 8020.
2. If the subsequent ground-water analytical results confirm the findings of the October 1996 analytical data (no exceedance of VGESs), GWV will complete a "Site Management Activities Completed" (SMAC) petition on behalf of Gayton and Linda Veilleux and submit the petition to the Vermont Department of Environmental Conservation (VT DEC) .

1.0 INTRODUCTION

This report details the results of an initial site investigation conducted at Troy Country Store located on Vermont Route 100 in the town of Troy, Vermont (Figure 1). This report has been prepared by Ground Water of Vermont (GWV) under the direction of Gayton and Linda Veilleux, current owners of the store. The site investigation was initiated with Vermont Department of Environmental Conservation (VT DEC) approval following the discovery of subsurface petroleum contamination during the removal of four underground storage tanks (USTs) on 27 August 1996.

1.1 Site Location and Physical Setting

The site is occupied by a convenience store with a partial basement and an upstairs apartment, a second residence, and a new canopy over the new 12,000-gallon partitioned UST. The ground surface around the store has an average elevation of about 700 feet above mean sea level and slopes toward the southwest. Surface drainage appears to be controlled by the slope of the ground surface and parking lots, and the on-site storm water system. The presumed direction of ground-water flow in the area is toward the south-southwest in the direction of the Missisquoi River, which is located approximately 1,000 feet south of the store (USGS, 1984).

The store, on-site residence, and all nearby buildings are served by municipal drinking water and private septic systems.

Native surficial materials in the vicinity of the store are mapped as recent alluvium consisting of fluvial sands and gravel (Stewart and MacClintock, 1970). Bedrock in the area is mapped as the Ottauquechee Formation, which is composed of black carbonaceous phyllite or schist of upper Cambrian age, and the Stowe Formation, which is composed of quartz-sericite-chlorite phyllite and schist of lower Ordovician age (Doll, 1961).

1.2 Site History

The property is owned and operated by Gayton and Linda Veilleux, who reside on the property. The Veilleux's purchased the store from Mr. Ernest Riando in 1988. According to Mr. Veilleux, the site has been occupied by a general store since the 1950s and has had USTs on-site since at least the mid-1950s.

On 27 August 1996, GWV supervised the removal of four underground storage tanks (USTs) — a 550-gallon abandoned kerosene UST (UST #1), a 2,000-gallon diesel UST, (UST #2), a 4,000-gallon gasoline UST (UST #3), and a 6,000-gallon gasoline UST (UST #4).

The kerosene UST (UST #1), discovered during the removal, was found to be in poor condition with two large holes observed in the bottom. All other USTs appeared to be in fair to excellent condition with no evidence of releases. Piping and pumps associated with the other USTs, however, exhibited evidence of petroleum releases to the subsurface. The releases appear to represent a combination of historical overfills, piping leaks, and possibly releases from previous UST generations.

Soils in the UST excavations consisted of brown coarse-to-medium sand and gravel from the surface to a depth of two feet, underlain by fine light brown-gray sand to the bottom of excavation at a depth of 10 feet. Petroleum odors and stained soils were detected at each identified leak site and around the fill pipes on all of the USTs. Petroleum odors detected in the diesel UST excavation exhibited what appeared to be a combination of weathered kerosene and diesel odor. Weathered gasoline odors were observed in the UST #3 and 4 excavation. No ground water or free-phase petroleum product were detected in any of the excavations. No elevated PID readings, petroleum odors, or seeps were observed in the basements of the two on-site buildings

PID readings on soil samples collected from the kerosene UST excavation ranged from 70.6 to 189 parts per million (ppm) and averaged 130 ppm. PID readings on soil samples collected from the diesel UST excavation ranged from 0.0 to 210 ppm and averaged 40 ppm. PID readings on soil samples collected from the gasoline UST excavation ranged from 46.2 to 343 ppm and averaged 200 ppm. All excavated soils were backfilled.

GWV initiated an initial site investigation under the VT DEC "Expressway" process after receiving approval on 16 September 1996 from Mr. Gayton Veilleux, owner of the Troy Country Store, and the VT DEC.

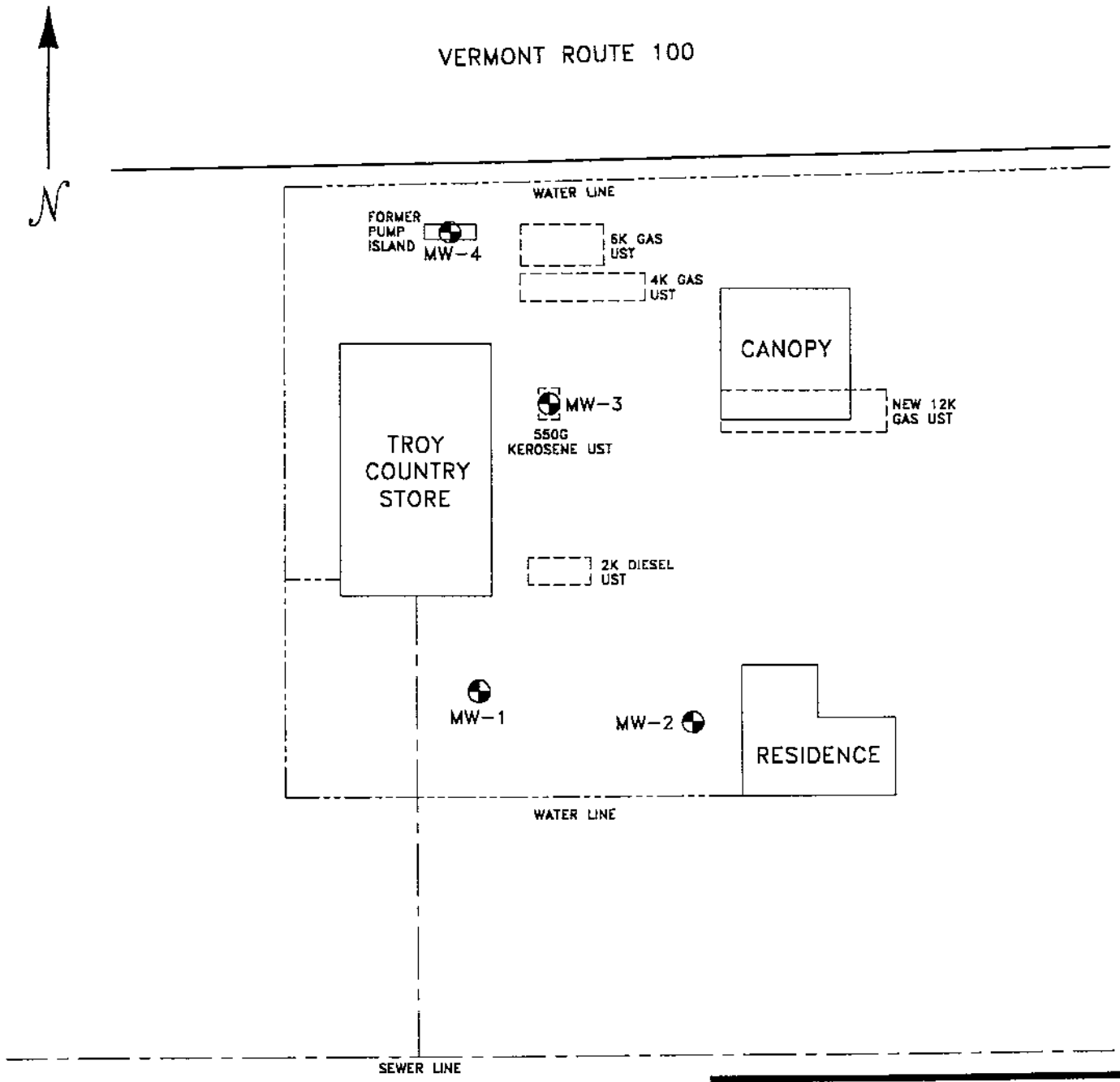
1.3 Objectives and Scope of Work

The objectives of this initial site investigation were to:

- Evaluate the degree and extent of petroleum contamination in soil and ground-water;
- Qualitatively assess the risks to environmental and public health via relevant sensitive receptors and potential contaminant migration pathways; and
- Identify potentially appropriate monitoring and/or remedial actions based on the site conditions.

To accomplish these purposes, GWV has:

- Reviewed existing historical site data.
- Supervised the installation of four soil borings/monitoring wells, and determined the extent of petroleum contamination, and the local ground-water flow direction, gradient and approximate velocity.
- Screened subsurface soils from the soil borings for the possible presence of volatile organic compounds (VOCs) using a photoionization detector (PID).
- Collected and submitted ground-water samples from the on-site monitoring wells for laboratory analysis of volatile petroleum compounds and total petroleum hydrocarbons.
- Identified sensitive receptors in the area, and assessed the risk posed by the contamination to these potential receptors.
- Evaluated the need for treatment and/or a long-term monitoring plan for the site.
- Prepared this summary report, which details the work performed, qualitatively assesses risks, provides conclusions and offers recommendations for further action.



ALL LOCATIONS ARE APPROXIMATE

Ground Water of Vermont
1 Mill St., Box C-5
Burlington, VT 05401
(802) 860-6065

TROY COUNTRY STORE
TROY, VT

FIGURE 2.
SITE MAP
WITH MONITORING WELL LOCATIONS

LEGEND:
MONITORING WELL

DRAWN BY: STE	DATE: NOV 1996
APPROVED BY: RM	FILE No.: 96069

portable photoionization detector (PID). The PID was calibrated with an isobutylene standard gas to a benzene reference.

2.3 Determination of Ground-Water Flow Direction and Gradient

Ground water in the unconfined surficial aquifer directly beneath the site appears to be flowing in a south-southwesterly direction, toward the Missisquoi River. The average gradient of the local ground-water table on 2 October 1996 was about 4 percent. Average flow velocities in the ground water moving through the brown medium-to-fine silty deposits are estimated to be in the range of 0.06 to 5.6 feet per day (ft/day). Water-level measurements and elevation calculations for 2 October 1996 are presented in Table 1. The ground-water contour map in Figure 3 was prepared using this data.

TABLE 1. Ground-Water Elevation Data

Well I. D.	Top of Casing Elevation *	Depth to Water (feet, TOC)	Ground Water Elevation
MW-1	96.64	16.30	80.34
MW-2	97.08	16.64	80.44
MW-3	99.17	16.34	82.83
MW-4	100.00	16.69	83.31

*Top of casing (TOC) and ground water elevations are relative to an arbitrary site datum of 100.00 feet

Fluid levels were measured in the four monitoring wells on 2 October 1996. The depth to water varied from 9.36 feet (MW-1) to 14.84 feet (MW-3) below top-of-casing. No free-phase petroleum was observed in any of the on-site monitoring wells. Static water-table elevations were computed for each monitoring well by subtracting the measured depth-to-water readings from the surveyed top-of-casing elevations, which are relative to an arbitrary site datum of 100.00 feet.

The shallow aquifer at the site consists predominately of brown medium-to-fine silty sand, which typically exhibit effective porosities of about 0.2 to 0.4 and hydraulic conductivities of about 0.3 to 28 ft/day (Fetter, 1994). Assuming Darcian flow, these estimated ranges of porosity and conductivity combine with the calculated ground-water gradient of 4 percent to yield an estimated range of ground-water flow velocities in the surficial aquifer of between 0.06 and 5.6 ft/day.

2.4 Ground-Water Sampling and Analysis

Review of the ground-water analytical results indicates that none of the Vermont Groundwater Enforcement Standards (VGESs) for benzene, toluene, ethylbenzene, xylenes (BTEX) were exceeded in any of the ground water samples collected on-site. The sample collected from MW-4 contained trace levels of benzene (less than 1 parts per billion - ppb), 1.5 ppb of toluene, and total xylenes at 6.6 ppb. Benzene was detected at 1.5 ppb in MW-3.

Methyl-tertiary butyl ether (MTBE) was detected at 1.3 and 1.6 ppb in the duplicate samples collected from MW-4. Trace levels (less than 1 part per million - ppm) of total petroleum hydrocarbons (TPH) were detected in each of the ground-water samples, except the sample collected from MW-1. Ground-water analytical results are summarized below in Table 2 and the contaminant distribution is shown on Figure 4. Laboratory report forms are included in Appendix B.

TABLE 2. Ground-Water Analytical Results
2 October 1996

Well I.D.	Benzene	Ethyl benzene	Toluene	Xylenes	MTBE	TPH
MW-1	ND <1	ND <1	ND <1	ND <1	ND <1	ND <1 ppm
MW-2	ND <1	ND <1	ND <1	ND <1	ND <1	TBQ<1 ppm
MW-3	**1.5**	ND <1	TBQ <1	ND <1	ND <1	TBQ<1 ppm
MW-4	TBQ <1	ND <1	**1.4**	**6.6**	**1.3**	TBQ<1 ppm
MW-4 Dup	TBQ <1	ND <1	**1.1**	**5.1**	**1.6**	TBQ<1 ppm
VGES*	**5**	**680**	**2,240**	**400**	**40**	---

Results reported as parts per billion (ppb), unless noted otherwise.
ND = Compound not detected above indicated detection limit.
TBQ = Compound detected at trace levels below quantitation limit indicated.
VGES = Vermont Groundwater Enforcement Standard. * Vermont Health Advisory for MTBE.

Ground-water samples were collected from the four monitoring wells on 2 October 1996. Each monitoring well was purged and then sampled using the dedicated bailer and dropline. Purge water was discharged directly to the ground in the vicinity of each well. A trip blank and a duplicate sample were collected during the sampling event for quality assurance/quality control (QA/QC) purposes. All field procedures were conducted in accordance with GWV standard protocols.

The ground-water samples were submitted to Endyne, Inc. of Williston, Vermont where they were analyzed for the possible presence of benzene, toluene, ethylbenzene, xylenes (BTEX) and methyl-tertiary butyl ether (MTBE) by EPA Method 8020 and total petroleum hydrocarbons (TPH) by modified EPA Method 8100. Analytical results from the QA/QC samples indicate that adequate QA/QC was maintained during sample collection and analysis. No petroleum compounds were detected in the trip blank. BTEX concentrations in the duplicate samples were within 1.5 ppb and the TPH results were identical.

3.0 SENSITIVE RECEPTOR SURVEY AND RISK ASSESSMENT

3.1 Sensitive Receptor Survey

GWV conducted a survey to identify sensitive receptors in the vicinity of the Troy Country Store that could potentially be impacted by residual soil contamination. The following sensitive receptors were identified in the vicinity of the site:

- The partial basement of the on-site store located approximately 10 feet southwest of the former USTs, and downgradient of the former USTs and pump island.
- The basement of the on-site residence located approximately 60 feet south of the former USTs, and obliquely downgradient of the former USTs and pump island.
- The Missisquoi River, located approximately 1,000 feet south of the store.

No drinking water supply wells are located on-site or on adjacent properties— drinking-water for the area is supplied by a municipal system located approximately 2,500 feet southwest of the store.

3.2 Risk Assessment

GWV assessed the risks that the residual subsurface contamination poses to the receptors identified above. In general, human exposure to petroleum related contamination is possible through inhalation, ingestion, or direct contact while impacts to environmental receptors are due either to a direct release or contaminant migration through one receptor to another or along a preferential pathway.

The findings of our risk assessment indicate that the residual subsurface petroleum contamination at the site does not appear to pose a significant threat to any nearby sensitive receptors. Observations made during the UST closure and recent ground-water sample results from monitoring wells completed in and downgradient of the former USTs suggest that residual soil contamination is limited to the immediate vicinity of the former USTs. Current information suggests that it is unlikely that residual ground-water contamination from the site would migrate to the Missisquoi River, located 1,000 feet south of the store. Also, PID readings obtained in the basements of both on-site buildings on 27 August 1996 did not identify the presence of VOCs above background. The on-site buildings and adjacent properties receive drinking-water from a municipal system.

4.0 CONCLUSIONS

Based on the results of the site investigation described above, GWV concludes the following:

- Petroleum releases from former underground storage tank (UST) systems at the site appear to have resulted in a minor impact to ground water in the vicinity of the former UST systems. Analytical results of ground-water samples collected from four on-site monitoring wells did not detect the presence of petroleum compounds above the VGESs.
- Observations made during the UST closure and ground-water sample results from monitoring wells completed in and downgradient of the former UST locations suggest that residual soil contamination is limited to the immediate vicinity of the former USTs.
- The residual subsurface contamination at the site does not appear to pose a threat to any near by sensitive receptors.
- PID readings obtained in the basements of both on-site buildings did not identify VOCs above background during screening on 27 August 1996.
- No drinking-water supplies appear to be at risk from the residual soil contamination at the site.
- Surficial materials at the site consist predominately of brown medium-to-fine silty sand, with occasional thin lenses of silt and clay. On 2 October 1996, the water table was found to be about 9 to 14 feet below ground surface, and exhibited a southwesterly trending gradient of about 4 percent. The representative range of ground-water flow velocities are expected to be between 0.06 and 5.6 feet per day.

5.0 RECOMMENDATIONS

On the basis of the results of this investigation and the conclusions stated above, Ground Water of Vermont recommends the following:

1. The four on-site monitoring wells should be resampled to confirm the October 1996 analytical results. The samples should be analyzed for BTEX compounds and MTBE by EPA Method 8020.

2. If the subsequent ground-water analytical results confirm the findings of the October 1996 analytical data (no exceedance of VGESs), GWV will complete a "Site Management Activities Completed" (SMAC) petition on behalf of Gayton and Linda Veilleux and submit the petition to the Vermont Department of Environmental Conservation (VT DEC).

6.0 REFERENCES

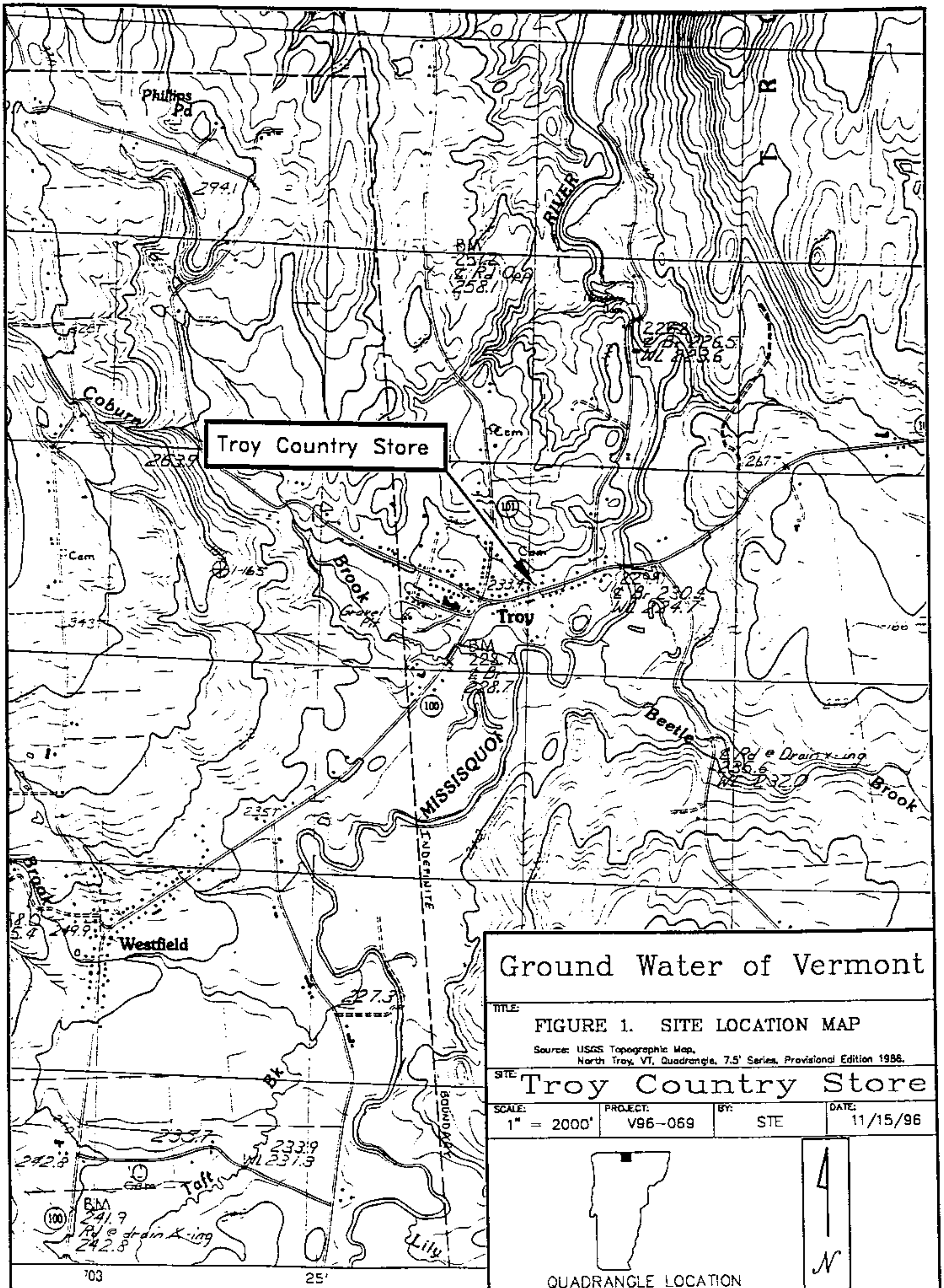
Doll, C.G. and others, 1961. *Geologic Map of Vermont*, Office of the State Geologist.

Domenico, P.A., and Schwartz, F.W., 1990. *Physical and Chemical Hydrogeology*, John Wiley and Sons, New York, 824 p.

Fetter, C.W., 1994. *Applied Hydrogeology, 3rd Ed.*, Prentice Hall, Englewood Cliffs, New Jersey, 691 p.

Stewart, D.P. and MacClintock, P., *1970. Surficial Geologic Map of Vermont*, Office of the State Geologist.

USGS, 1984. North Troy Quadrangle Vermont. U.S. Geological Survey. 7.5x15 minute series (topographic). Provisional Edition, 1986.



Ground Water of Vermont

TITLE: FIGURE 1. SITE LOCATION MAP

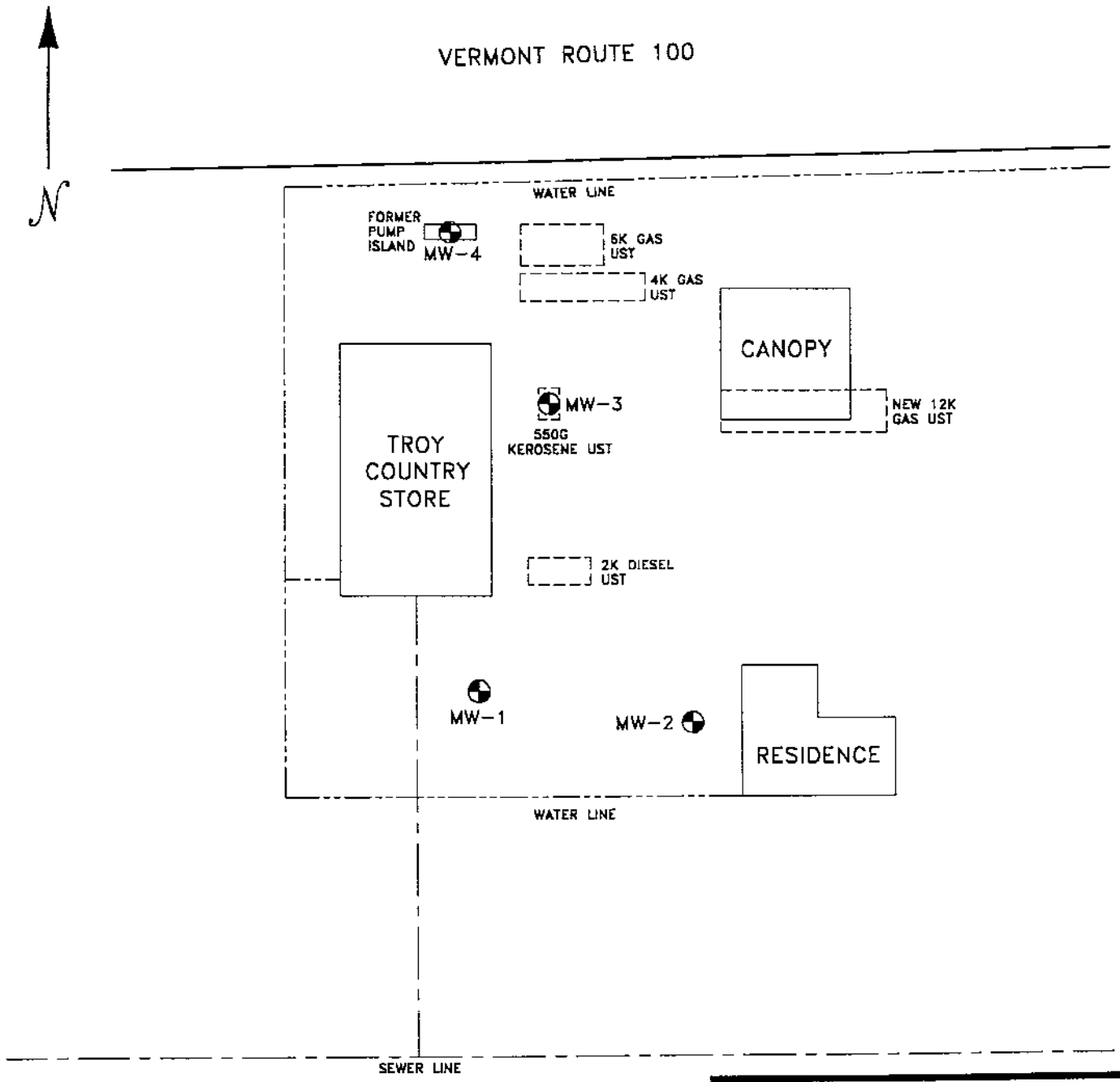
Source: USGS Topographic Map, North Troy, VT, Quadrangle, 7.5' Series, Provisional Edition 1986.

SITE: Troy Country Store

SCALE:	PROJECT:	BY:	DATE:
1" = 2000'	V96-069	STE	11/15/96

QUADRANGLE LOCATION

N



ALL LOCATIONS ARE APPROXIMATE

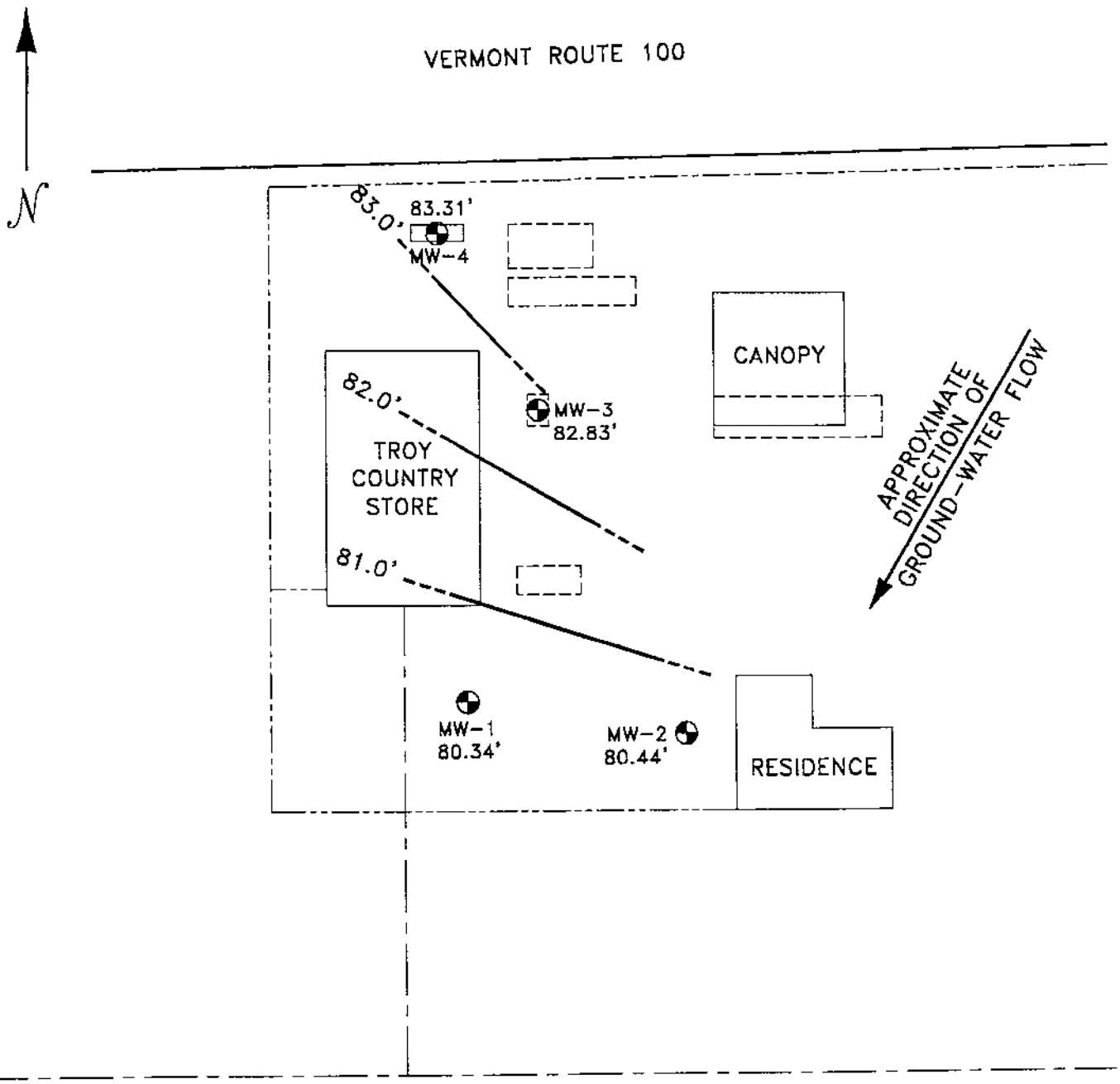
Ground Water of Vermont
1 Mill St., Box C-5
Burlington, VT 05401
(802) 860-6065

TROY COUNTRY STORE
TROY, VT

FIGURE 2.
SITE MAP
WITH MONITORING WELL LOCATIONS

LEGEND:
MONITORING WELL

DRAWN BY: STE	DATE: NOV 1996
APPROVED BY: RM	FILE No.: 96069



MISSISQUOI
RIVER
APPROXIMATELY
1/2 MILE

0 30'

ALL LOCATIONS ARE APPROXIMATE

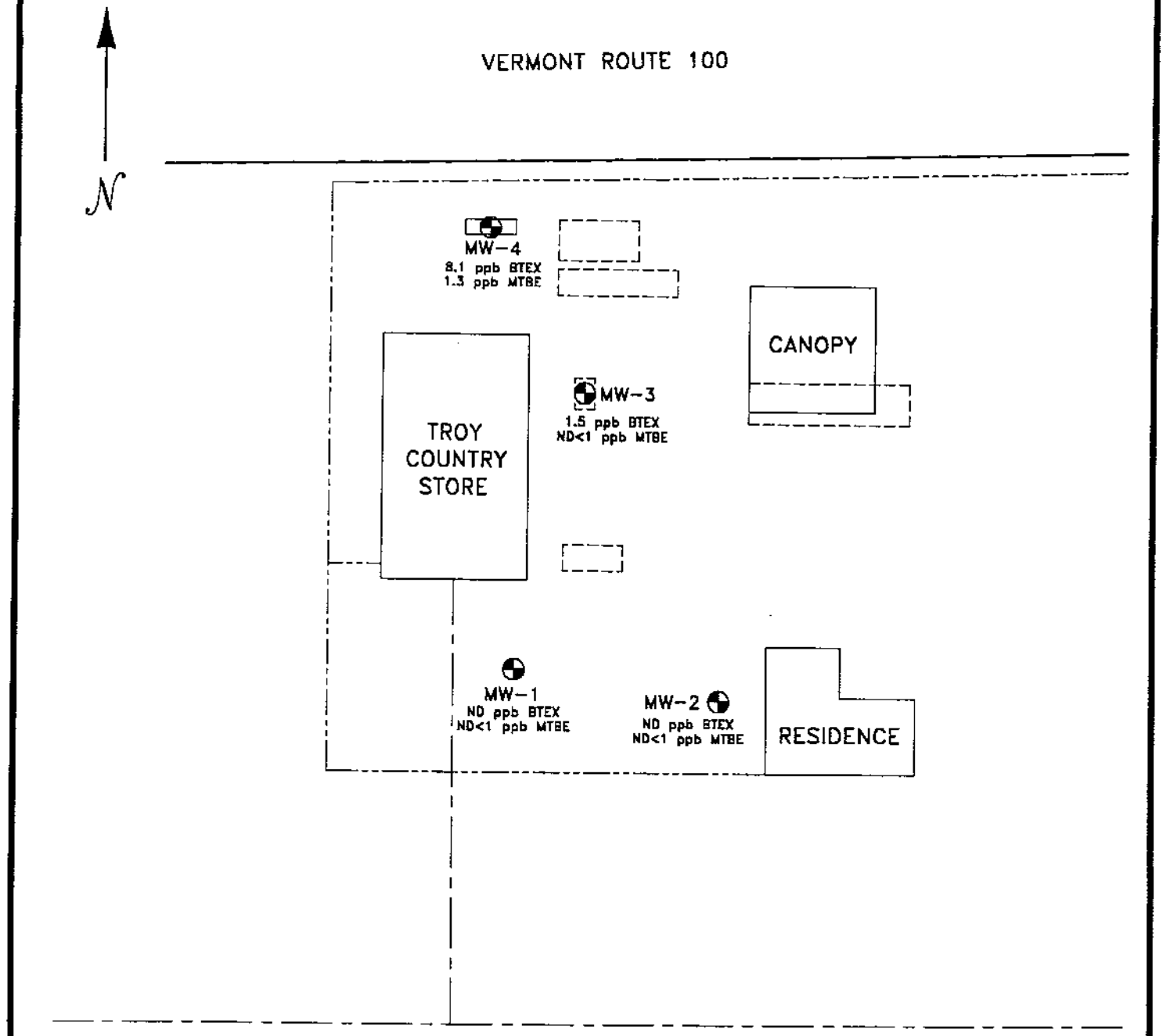
Ground Water of Vermont
1 Mill St., Box C-5
Burlington, VT 05401
(802) 860-6065

TROY COUNTRY STORE
TROY, VT

FIGURE 3.
GROUND-WATER CONTOUR MAP
MONITORING DATE: 2 OCTOBER 1996

LEGEND: — GROUND-WATER CONTOUR
⊕ MONITORING WELL

DRAWN BY: STE	DATE: NOV 1996
APPROVED BY: RM	FILE No.: 96069



MISSISQUOI RIVER APPROXIMATELY 1/2 MILE

0 30'

ALL LOCATIONS ARE APPROXIMATE

Ground Water of Vermont
1 Mill St., Box C-5
Burlington, VT 05401
(802) 860-6065

TROY COUNTRY STORE
TROY, VT

FIGURE 4.
CONTAMINANT DISTRIBUTION MAP
MONITORING DATE: 16 JULY 1996

LEGEND:
MONITORING WELL
ND NONE DETECTED

DRAWN BY: STE	DATE: NOV 1996
APPROVED BY: RM	FILE No.: 96069

APPENDIX A

Soil Boring and Well Construction Logs

Ground Water of Vermont

FIELD SUPERVISOR	Brian Stever
CONTRACTOR	Adams Engineering
DRILLERS	Jerry Adams
JOB LOCATION	Troy Country Store
DATE	9/23/96

DRILLING METHOD: vibratory

BORING DIAMETER: 2.375"

AND 40 – 50%
SOME 10 – 40%
TRACE 0 – 10%

BORING LOCATION: sketch on back or on-site plan with measurements

BORING #: MW-1

TOTAL DEPTH: 20'

DEPTH	SAMPLES	SAMPLE NUMBER	BLOWS PER 6" 0/6	6/12	12/18	18/24	REC.	SAMPLE DESCRIPTION	STRAT CHG	PID Readings in GENERAL DESCRIPTION parts per million (ppm)	WELL DETAIL	DEPTH
							3.0	fine dark brown sand ↓		0-5 - 0.0 ppm dry; no odors or sheens	RISER / Native	
5'							4.0			5-10 - 0.0 ppm; dry	RISER / Native	5'
10'							5.0	fine brown sand + silt; fine brown sand ↓		10-15' - 0.0 ppm wet - perched water table; dryer; ← WTable	SCREEN / SAND	10'
15'							5.0			15-20 - 0.0 ppm no odors or sheens	SCREEN / SAND	15'
20'												20'
25'												25'
30'												30'
35'												35'
40'												40'

MATERIALS USED	SIZE/TYPE	QUANTITY
WELL SCREEN	2"/PVC	10'
SLOT SIZE	0.010/PVC	10'
RISER PIPE	2"/PVC	9.7'
GRADED SAND	#1	1 gallon
PELLET BENTONITE		
GRANULAR BENTONITE	yes	1/2 gallon

MATERIALS USED	SIZE/TYPE	QUANTITY
GROUT	yes	
BACKFILL	yes	
WATER USED	no	
STEAM CLEANER	yes	

Ground Water of Vermont

FIELD SUPERVISOR Brian Sterer
CONTRACTOR Adams Engineering
DRILLERS Jerry Adams

JOB LOCATION TROY COUNTRY STORE
DATE 9/23/96

DRILLING METHOD vibratory
BORING DIAMETER 2.375"

AND 40 – 50%
SOME 10 – 40%
TRACE 0 – 10%

BORING LOCATION
sketch on back or on site plan with measurements

BORING # MW-2
TOTAL DEPTH 20'

DEPTH	SAMPLES	SAMPLE NUMBER	BLOWS PER 6" (0/6, 6/12, 12/18, 18/24)	REC.	SAMPLE DESCRIPTION	STRAT CHG	PID Readings in Parts per million (ppm) GENERAL DESCRIPTION	WELL DETAIL
				4.5	topsoil fine light brown sand with a trace of silt ↓		0-5' - 0.0 ppm dry no odors	
5'				4.8			tight 5-10' - 0.0 ppm damp	
					fine light brown sand ↓			
10'				4.8			damp 10-15' 0.0 ppm ~ water table	
					gray clay layer			
					fine brown sand ↓		wet no odors	
15'				5.0				
					gray clay layer		- malleable	
					fine brown sand ↓		15-20 - 0.0 ppm no odors	
20'								
25'								
30'								
35'								
40'								

WELL DETAIL: RISER (Native), SCREEN, SAND

MATERIALS USED	SIZE/TYPE	QUANTITY	MATERIALS USED	SIZE/TYPE	QUANTITY
WELL SCREEN	2"/PVC	10'	GROUT	yes	
SLOT SIZE	0.10/PVC	10'	BACKFILL	yes	
RISER PIPE	2"/PVC	9.7	WATER USED	no	
GRADED SAND	#1	1 gallon	STEAM CLEANER	yes	
PELLET BENTONITE					
GRANULAR BENTONITE	yes	1/2 gallon			

Ground Water of Vermont

FIELD SUPERVISOR Brian Storer
CONTRACTOR Adams Engineering
DRILLERS Jerry Adams

JOB LOCATION Troy Country Store
DATE 9/23/96

DRILLING METHOD vibratory
BORING DIAMETER 2.375"

AND 40 – 50%
SOME 10 – 40%
TRACE 0 – 10%

BORING LOCATION sketch on back or on-site plan with measurements
BORING # MW-3
TOTAL DEPTH 22'

DEPTH	SAMPLES	SAMPLE NUMBER	BLOWS PER 6" 0/6	6/12	12/18	18/24	REC.	SAMPLE DESCRIPTION	STRAT CHG	PID Readings in GENERAL DESCRIPTION Parts per million (ppm)
							4.5	Poorly sorted brown sand and gravel		0-5' - 216 ppm Strong kerosene odor
5'							5.0	Fine gray - brown sand		5-7' - 269 ppm Strong odor, weathered kerosene, stained soils
								Fine brown sand		7-10' - 5.2 ppm dry, odors, no sheens and stained soils
10'							4.0			10-15' - 7.1 ppm dry.
15'							5.0			- Water Table 15-16' - 3.2 ppm
								gray clay layer		- dryer 16-20' - 2.3 ppm strong odor - wet
20'							3.0	Fine brown sand		20-23' - 106 ppm
25'										
30'										
35'										
40'										

WELL DETAIL: RISER; Native; SAND; SCREEN

MATERIALS USED	SIZE/TYPE	QUANTITY
WELL SCREEN	2"/PVC	10'
SLOT SIZE	0.10/PVC	10'
RISER PIPE	2"/PVC	12'
GRADED SAND	#	1 gallon
PELLET BENTONITE		
GRANULAR BENTONITE	yes	1/2 gallon

MATERIALS USED	SIZE/TYPE	QUANTITY
GROUT	yes	
BACKFILL	yes	
WATER USED	no	
STEAM CLEANER	yes	

Ground Water of Vermont

FIELD SUPERVISOR Brian Storer
CONTRACTOR Adams Engineering
DRILLERS Jerry Adams

JOB LOCATION Troy Country Store
DATE 9/23/96

DRILLING METHOD Vibratory
BORING DIAMETER 2.375"

AND 40 – 50%
SOME 10 – 40%
TRACE 0 – 10%

BORING LOCATION sketch on back or on-site plan with measurements
BORING # MW-4
TOTAL DEPTH 20'

DEPTH	SAMPLES	SAMPLE NUMBER	BLOWS PER 6" 0/6	6/12	12/18	18/24	REC.	SAMPLE DESCRIPTION	STRAT CHG	GENERAL DESCRIPTION (PID Readings in Parts per million (ppm))	WELL DETAIL	DEPTH
							4.5	poorly sorted brown (dry) sand and gravel		0-5 - 311 ppm strong gasoline odor	Native	
								fine light brown sand ↓		dry, odor 5-7 - 204 ppm dry, odor		
5'							4.5			1/10' gray silt lense	RISER	5'
								fine to medium light brown sand ↓		7-10' - 18.2 ppm dry, no odor		
10'							5.0			10-14' - 7.2 ppm ~ water table	SAND	10'
15'							5.0	fine brown sand ↓		14-15 - 1.4 ppm no odor	SCREEN	15'
								fine brown sand ↓		1/10' gray silt lense 15-20 - 3.0 ppm no odor		
20'												20'
25'												25'
30'												30'
35'												35'
40'												40'

MATERIALS USED	SIZE/TYPE	QUANTITY
WELL SCREEN	2"/PVC	10'
SLOT SIZE	0.20/PVC	10'
RISER PIPE	2"/PVC	9.7'
GRADED SAND	#1	1 gallon
PELLET BENTONITE		
GRANULAR BENTONITE	yes	1/2 gallon

MATERIALS USED	SIZE/TYPE	QUANTITY
GROUT	yes	
BACKFILL	yes	
WATER USED	no	
STEAM CLEANER	yes	

APPENDIX B

Laboratory Report Forms

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: GroundWater of Vermont
PROJECT NAME: Troy Country Store
REPORT DATE: October 10, 1996
DATE SAMPLED: October 2, 1996

PROJECT CODE: GWVT1373
REF.#: 94,521 - 94,525

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: GroundWater of Vermont
PROJECT NAME: Troy Country Store
CLIENT PROJ. #: V96-075

DATE RECEIVED: October 3, 1996
REPORT DATE: October 10, 1996
PROJECT CODE: GWVT1373

Ref. #:	94,521	94,522	94,523	94,524	94,525
Site:	Duplicate	MW-1	MW-2	MW-3	MW-4
Date Sampled:	10/2/96	10/2/96	10/2/96	10/2/96	10/2/96
Time Sampled:	NI	11:40	11:45	12:00	12:05
Sampler:	BH/BS	BH/BS	BH/BS	BH/BS	BH/BS
Date Analyzed:	10/10/96	10/10/96	10/10/96	10/10/96	10/10/96
UIP Count:	>10	0	0	>10	>10
Dil. Factor (%):	100	100	100	100	100
Surr % Rec. (%):	94	95	98	98	96
Parameter	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)
Benzene	TBQ <1	<1	<1	1.5	TBQ <1
Chlorobenzene	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1	<1
Ethylbenzene	<1	<1	<1	<1	<1
Toluene	1.1	<1	<1	TBQ	1.5
Xylenes	5.1	<1	<1	<1	6.6
MTBE	1.6	<1	<1	<1	1.3

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated

ENDYNE, INC. GWVT 1374

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

19227

CHAIN-OF-CUSTODY RECORD

94,521—94,530

Project Name: Troy Country Store Site Location: Troy, VT	Reporting Address: 1 Mill St Box C-5 Burlington, VT 05401	Billing Address: Same
Endyne Project Number: GWVT # 090-075 GWVT 1373	Company: Ground water of VT Contact Name/Phone #: A. Miller 860-6065	Sampler Name: B.H., B.S. Phone #: 860-6065

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
94,521	duplicate	W	X		10/2/96 —	3	VOA		30	I/HCl	
94,522	mw-1	↓	↓		1140A	↓	↓		↓	↓	
94,523	mw-2	↓	↓		1145A	↓	↓		↓	↓	
94,524	mw-3	↓	↓		1200P	↓	↓		↓	↓	
94,525	mw-4	↓	↓		1205P	↓	↓		↓	↓	

Relinquished by: Signature [signature]	Received by: Signature Harry R. Piccini	Date/Time 10-3-96 1045
Relinquished by: Signature	Received by: Signature [signature]	Date/Time 10/3/96 1120

New York State Project: Yes ____ No X

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD$_5$	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify): 8020 + MTBE, TPH by 8100										

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
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FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: GroundWater of Vermont
PROJECT NAME: Troy Country Store/#V96-075
DATE REPORTED: October 8, 1996
DATE SAMPLED: October 2, 1996

PROJECT CODE: GWVT1374
REF. #: 94,526 - 94,530

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated sample preservation with HCl.

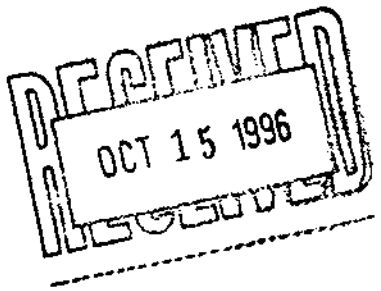
All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,



Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8100

DATE: October 8, 1996
CLIENT: GroundWater of Vermont
PROJECT: Troy Country Store/#V96-075
PROJECT CODE: GWVT1374
COLLECTED BY: B.H., B.S.
DATE SAMPLED: October 2, 1996
DATE RECEIVED: October 3, 1996

Reference #	Sample ID	Concentration(mg/L)[1]
94,526	Duplicate	TBQ[2]
94,527	MW-1; 11:40	ND[3]
94,528	MW-2; 11:45	TBQ
94,529	MW-3; 12:00	TBQ
94,530	MW-4; 12:05	TBQ

Notes:

1 Method detection limit is 1.0 mg/L.
2 Trace below quantitation limit
3 None Detected

ENDYNE, INC.

32 James Brown Drive
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19227

CHAIN-OF-CUSTODY RECORD

Project Name: Troy Country Store Site Location: Troy VT	Reporting Address: 1 Mill St Box C-5 Burlington VT 05401	Billing Address: Same
Endyne Project Number: [redacted] GWU # 096-075	Company: Ground Water of VT Contact Name/Phone #: R. Miller 860-6065	Sampler Name: B.H., B.S. Phone #: 860-6065

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
94,527	[redacted]	W	X		10/2/96 —	3	VOA		8030	1/HCl	
94,528	mw-1				1140A						
94,529	mw-2				1145A						
94,530	mw-3				1200P						
	mw-4				1205P						

Relinquished by: Signature	Received by: Signature	Date/Time 10-3-96 1045
Relinquished by: Signature	Received by: Signature	Date/Time 10/3/96 1120

New York State Project: Yes ___ No X

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify): 8020 + MTBE + 8100										